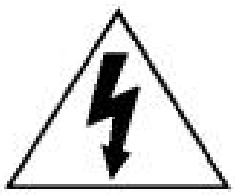
DIGITAL VIDEO RECORDER

USER MANUAL

DVR-4200

Please read instructions thoroughly before operation and retain it for future reference.

IMPORTANT SAFEGUARD



CAUTION

RISK OF ELECTRIC SHOCK

CAUTION:

To reduce the risk of electric shock, do not expose this apparatus to rain or moisture.

Only operate this apparatus from the type of power source indicated on the label.

The company shall not be liable for any damages arising out of any improper use,

even if we have been advised of the possibility of such damages.

Graphic Symbol Explanation

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

All lead-free products offered by the company comply with the requirements of the European law on the Restriction of Hazardous Substances (RoHS) directive, which means our manufacture processes and products are strictly “lead-free” and without the hazardous substances cited in the directive.

The crossed-out wheeled bin mark symbolizes that within the European Union the product must be collected separately at the product end-of-life. This applies to your product and any peripherals marked with this symbol. Do not dispose of these products as unsorted municipal waste. Contact your local dealer for procedures for recycling this equipment.

This apparatus is manufactured to comply with the radio interference requirements.

Disclaimer

We reserve the right to revise or remove any content in this manual at any time. We do not warrant or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of this manual. For the actual display & operation, please refer to your DVR in hand. The content of this manual is subject to change without notice.

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The GPL Code used in this product is released without warranty and is subject to the copyright of the corresponding author.

Further source codes which are subject to the GPL-licenses are available upon request.

We are pleased to provide our modifications to the Linux Kernel, as well as a few new commands, and some tools to get you into the code. The codes are provided on the FTP site, and please download them from the following site or you can refer to your distributor:

http://www.securitycameradistributor.com/category_s/70.htm

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1. SPECIAL NOTES

- VGA Output Resolution Support

Model 1 and Model 2 have VGA interface built-in, and users are allowed to change the resolution depending on their display monitor.

Go to “ADVANCE” → “DISPLAY”, and move to “VGA OUTPUT” to select the VGA resolution you want. There are seven options as follows:

1) 800 x 600
2) 1024 x 768 (default)
3) 1280 x 1024
4) 1440 x 900
5) 1400 x 1050
6) 1680 x 1050
7) 1600 x 1200

Note: To have the best image quality on your LCD monitor, make sure (1) the selected DVR VGA output resolution is supported by your monitor, and (2) the VGA output settings on both the LCD monitor and DVR are consistent.
If the image is not positioned or scaled properly, please go to your monitor’s menu for adjustment. For details, please refer to the user manual of your LCD monitor.

- Power Supply

To ensure that your DVR works constantly and properly, it's recommended to use an UPS, Uninterruptible Power Supply, for continuously operation. (Optional)

2. FRONT AND REAR PANEL

2.1. Front Panel

1) LED Indicators

POWER : DVR is powered on.
HDD : HDD is reading or recording.
ALARM : An alarm is triggered (Selected models only).
TIMER : Timer recording is on.
PLAY : Under playback status.

2) MENU

Press to enter the main menu.

3) ENTER

Press to confirm the setting.

4) LIST

To quickly search the recorded files by event, press to show the event list.
Select one event, and press “ENTER” to playback the selected file.

5) PLAY

Press to play the recorded video.

6) SLOW

Under the playback mode, press to slowly playback the recorded file.

7) ZOOM

In the live or playback mode, press to enlarge the image of the selected channel.

8) SEQ

Press to activate the call monitor function, and press again to quit.

9) ⊞

Press to show the four-channel display mode.

10) POWER

Press long enough to turn on/off your DVR.

Note: Under the recording mode, please stop recording before turning off your DVR.

Note: To ensure that your DVR works constantly and properly, it's recommended to use an UPS, Uninterruptible Power Supply, for continuously operation. (Optional)

11) 1~4

Press one of the buttons to select the channel to display.

12) ▲ (⏸ / +) / ▼ (■ / -) / ◀ (⏪) / ▶ (⏩)

Press one of these four buttons to move up/down/left/right.
Under the playback mode, press these buttons to pause (⏸) / stop (■) / fast rewind (⏩) / fast forward (⏪) the playback file.
Under the setting mode, press ▲ / ▼ to change the setting in the menu.

13) AUDIO (SLOW + ZOOM)

Press “SLOW” + “ZOOM” at the same time to select live or playback sounds of the audio channels.

14) PTZ (SEQ + ⊞) (Selected models only)

Press “SEQ” + “⊞” at the same time to enter / exit the PTZ control mode.

Adjust PTZ angle: Press ▲ / ▼ / ◀ / ▶ to turn up/down/left/right.

15) USB port

To quickly backup or upgrade firmware/OSD, you can insert a compatible USB flash drive into this USB port. Before using the USB flash drive, please use your PC to format the USB flash drive as “FAT32” first.

2.2. Rear Panel

1) VIDEO INPUT (1 ~ 4)

Connect to video sources, such as cameras.

Note: If you want to make a video backup with audio, please make sure whether your DVR supports the audio function, and connect audio cameras to the channels which support the audio function.

---

2) VIDEO OUTPUT

Connect to a CRT monitor for video output.

3) AUDIO IN (Select models only)

Connect to audio sources, such as cameras equipped with the audio function.
Please get to know whether your DVR supports the audio function, and how many audio inputs are supported first.

Note: Depending on the model you have, this DVR series supports **UP TO FOUR** audio-in channels, which are Audio 1, Audio 2, Audio 3 and Audio 4 accordingly, and the audio data will be recorded with the video data of CH1, CH2, CH3 and CH4 respectively.
For example, if your DVR supports two audio-in, its audio channels will be Audio 1 and Audio 2. When you playback CH1, you will also hear the audio recording of Audio 1.

---

4) AUDIO OUT (Selected models only)

Connect to an audio device, such as a microphone or speaker.

5) IR (Selected models only)

Connect the IR receiver for remote control.

6) EXTERNAL I/O (Selected models only)

Insert the supplied 9PIN DSUB to this port for connecting external devices (external alarm, PTZ camera, etc).

For detailed I/O port PIN configuration, please refer to “APPENDIX 1 PIN CONFIGURATION (Selected models only)” at page 28.

7) VGA (Selected models only)

Connect to a LCD monitor directly.

8) LAN (Selected models only)

Connect to Internet by LAN cable.

9) DC 19V

Connect to the supplied adapter.

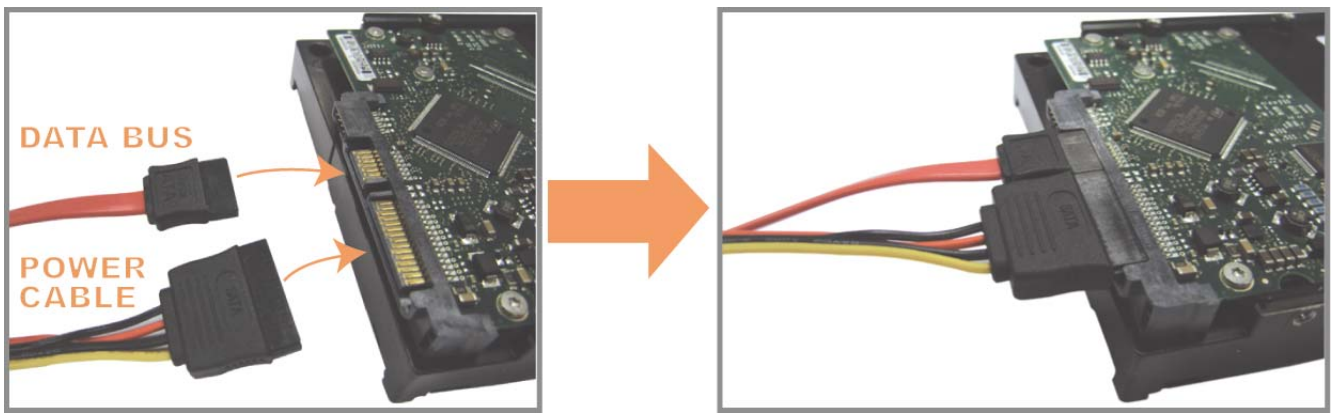
3. CONNECTION AND SETUP

3.1. HDD Installation

The HDD must be installed before the DVR is turned on.

Step 1: Loose the screws on the upper cover and remove it from the DVR. Find the two HDD brackets located on the DVR base as indicated below.

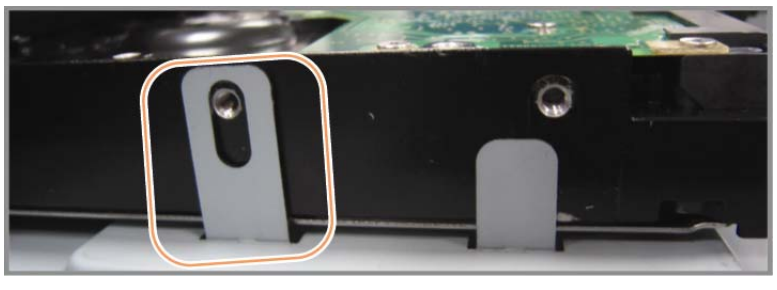
Step 2: Get a compatible HDD, and connect it to the power connector and data bus connector.



Step 3: Make sure the PCB side is facing up, and place the HDD between the HDD brackets on the DVR base as shown below.

Make sure the other side of the HDD is contacted with the DVR base for heat conduction.

Step 4: Align the screw hole on the each bracket with the screw hole on the each side of the HDD as shown below, and fix the HDD to the bracket with a HDD screw supplied.



Step 5: Close the upper cover of the DVR, and fasten all the screws you loosened in Step 1.

3.2. Camera Connection

The cameras must be connected and power-supplied. And then connect the camera video output to the DVR video input port with a coaxial cable or RCA lines with BNC connectors. The DVR will automatically detect the video system of the connected camera(s) (NTSC / PAL), and switch itself to the correct system.

1) Power connection

   Connect the camera with indicated power supply.

2) Video cable connection

   Connect the camera video output to the DVR video input port with a coaxial cable or RCA line with BNC connector.

3) Audio cable connection (Selected models only)

   Connect the camera audio output to the DVR audio input port with a coaxial cable or RCA line with BNC connector.

4) Camera Setup (PTZ cameras only)

   For detailed camera title, ID, protocol and baud rate setup, please refer to “5.5. REMOTE” at page 14.

3.3. Optional Peripheral Connection (Selected models only)

Depending on the DVR model you have, this DVR series may support to connect other peripherals. For detailed connection, please refer to their own user manuals.

3.4. Power Setup

This device should be operated only with the type of power source indicated on the manufacturer’s label. Connect the indicated AC power cord to the power adapter, and plug into an electrical outlet. The power LED will be on.

Note: To ensure that your DVR works constantly and properly, it's recommended to use an UPS, Uninterruptible Power Supply, for continuously operation. (Optional)

3.5. Date and Time Setting

Before operating your DVR, please set the date and time on your DVR first.

Press “MENU” and enter the password to go to the menu list. The default admin password is 0000. Move to “DATE” and you can set the date / time / daylight saving in the “DATE” menu list.

Note: Please DO NOT change the date or time of your DVR after the recording function is activated. Otherwise, the recorded data will be disordered and you will not be able to find the recorded file to backup by time search. If users change the date or time accidentally when the recording function is activated, it’s recommended to clear all HDD data, and start recording again.

Note: For the first time to use the DVR, please charge the DVR for at least 48 hours continuously after the date & time is set correctly.

3.6. Password Setting

Press “MENU” and enter the password to go to the menu list. Then, Move to “ADVANCE” to enter the advanced setting menu.

In the “ADVANCE” menu, move to “SYSTEM INFO”. Select “PASSWORD” and press “ENTER” to enter the submenu to set the password (four digits). The default admin password is 0000.

3.7. Record Setting

By defaults, the record function is activated when the DVR is powered on and a camera is connected.

To change the record settings, Press “MENU” and enter the password to go to the menu list. Then, Move to “RECORD” to enter the advanced setting menu.

For details, please refer to “5.2. RECORD” at page 10.

4. BASIC OPERATION

4.1 Live Page

Depending on the DVR you have, you may see the following live view screen with status icons.

Icon	Function	Icon	Function	Icon	Function	Icon	Function
	Key lock		Key unlock		1st live audio channel		2nd live audio channel
	3rd live audio channel		4th live audio channel		1st playback audio channel		2nd playback audio channel
	3rd playback audio channel		4th playback audio channel		Audio channel unselected		Digital zoom mode
	Digital zoom unselected		HDD overwrite		Timer recording		Motion
	Recording		Alarm (Selected models only)				

4.2. Recording

When the recording and the pre-alarm function are activated, this device will overwrite 8GB data from the oldest for continuous recording without notice.

1) Manual Recording Icon

By defaults, when the DVR is properly connected with cameras and the HDD is installed, you can see "" (recording) on the screen.

2) Event Recording Icon

When the motion / alarm detection is activated, once motion or external alarm happens, you will see "" (motion) or "" (external alarm) on the screen.

3) Timer Recording Icon

When the timer record is activated, you will see the LED light of "Timer" is on, and "" (timer) on the screen.

4.3. Playback

Press “PLAY” on the DVR control panel, and the device will playback the latest recorded video.

Note: There must be at least 8192 images of recorded data for playback to work properly. If not, the device will stop playback. For example, if the IPS is set to 30, the recording time should be at least 273 seconds (8192 images / 30 IPS) for the playback to work properly.

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1) Fast Forward / Fast Rewind

You can increase the speed for fast forward and rewind on this device. In the playback mode:
Press “⏩” once to get 4X speed forward and press twice to get 8X speed, etc. And the maximum speed is 32X.
Press “⏪” once to get 4X speed rewind and press twice to get 8X speed, etc. And the maximum speed is 32X.

Note: During playback, the image size of the recorded data (FRAME, FIELD or CIF) will be shown on the screen.

---

2) Pause / Image Jog

Press “⏸” to pause the playback.
In the pause mode:
Press “▶” once to get one frame forward.
Press “◀” once to get one frame rewind.

3) Stop

Press “■” under the playback mode, and the screen of this device will return to live monitoring mode.

4) Slow Playback

Press “SLOW” to get 1/4X speed playback and press twice to get 1/8X speed playback.

5) Audio Playback (Selected models only)

Press “SEQ” + “⊞” to select the live or playback sound of the audio channels.

Live audio of the 1st audio channel	Playback audio of the 1st audio channel
Live audio of the 2nd audio channel	Playback audio of the 2nd audio channel
Live audio of the 3rd audio channel	Playback audio of the 3rd audio channel
Live audio of the 4th audio channel	Playback audio of the 4th audio channel
The audio channel is not selected.	

Note: Depending on the model you have, this DVR series supports **UP TO FOUR** audio-in channels, which are Audio 1, Audio 2, Audio 3 and Audio 4 accordingly, and the audio data will be recorded with the video data of CH1, CH2, CH3 and CH4 respectively.
For example, if your DVR supports two audio-in, its audio channels will be Audio 1 and Audio 2. When you playback CH1, you will also hear the audio recording of Audio 1.

4.4. Search

1) Full Event Search

Press “LIST” to show the recorded files by event. Choose the item you want to see, and press “ENTER” to start playback.

2) Search by Time

Press “MENU” to enter the menu list, and go to “ADVANCE” → “EVENT LOG”. Move to “QUICK SEARCH”, and press “ENTER” to enter the quick time search menu. You can search any specific events by time (Year / Month / Day / Hour / Min) and directly play the file you find.

4.5. Firmware / OSD Upgrade

1) By using USB flash drive

Step 1. Format the USB memory device as FAT32 format first.

Step 2. Get the upgrade files from your distributor and save the upgrade files in your USB flash device (do not change the file name).

Step 3. Insert the USB flash drive into the DVR USB port.

Step 4. Press “MENU”, move to “ADVANCE” → “SYSTEM INFO”, and move to “UPGRADE”. Press “ENTER”.

Step 5. Select “YES”, and press “ENTER” again to confirm upgrade.

2) By using the supplied software “Video Viewer”

Step 1. Save the upgrade files at your PC (do not change the file name), and log into Video Viewer.

Step 2. Click “ ” (Miscellaneous Control) to show the miscellaneous control panel. In the miscellaneous control panel, click “ ” (Tools) on the miscellaneous control panel to enter the upgrade window.

Step 3. Enter the user name, password, IP address and port number of the DVR.

Step 4. Click “Firmware” or “Language” tab as needed, and click “Add” to select the firmware or OSD files to upgrade.

Step 5. Click “Update Firmware” or “Update Language” button to start the upgrade.

5. ADVANCED OPERATION

5.1. QUICK SEARCH

You can search any specific events by time and directly play the file you find from the DVR.
Move to “QUICK SEARCH”, and press “ENTER”. You will see the following submenu items:

1) DATE

Select the specific time period (YEAR / MONTH / DAY / HOUR / MIN) that you want to search.

2) SEARCH HDD

Change to the HDD you want if there are more than 1 HDD in your DVR.

3) START

Move to “START” and press “ENTER” button to search and directly playback the recorded files.

5.2. RECORD

In this menu list, you can set record settings. Press “MENU” on the front panel. The default admin password is **0000**. Enter the default password, and press “ENTER”.

5.2.1. Quick record setting

Move to “QUICK START” → “RECORD”, and press ”ENTER”. The screen will show the following submenu items:

1) IMAGE SIZE

Select FRAME, FIELD (Selected models only) or CIF.

2) QUALITY

Select one of the four quality options: SUPER BEST, BEST, HIGH & NORMAL.

3) IMAGE PER SECOND

Select the images per second for MANUAL RECORD.

5.2.2. Detailed record setting

Move to “ADVANCE” → “RECORD”, and press ”ENTER”. The screen will show the following submenu items:

1) MANUAL RECORD ENABLE

Start / stop the manual recording function.

2) EVENT RECORD ENABLE

Start / stop the event recording function. When this function is enabled, the recording will be triggered by any motion or external alarm.

3) TIMER RECORD ENABLE

Start / stop the timer recording that is activated according to the scheduled time

4) EVENT RECORD IPS

Select the images per second for EVENT RECORD (Recording that is triggered by alarm or motion).

5) TIMER RECORD IPS

Select the images per second for TIMER RECORD (Recording that is activated according to the scheduled time.).

6) PRE-ALARM RECORD

Select to enable or disable the pre-alarm function (ON / OFF).
When pre-alarm and event recording functions are both activated, the DVR will record 8MB data before an alarm / motion event is triggered.

7) OVERWRITE

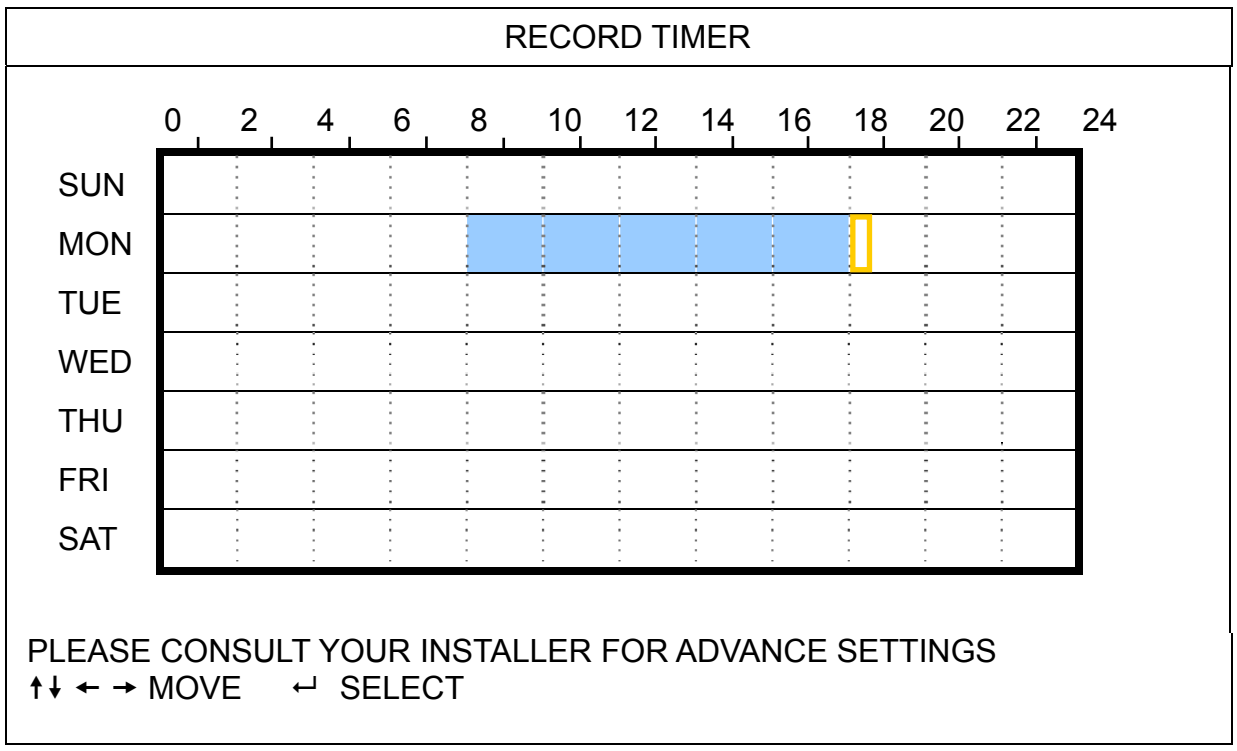
Select to overwrite previous recorded data in your HDD. When the HDD is full under the O/W recording mode, the DVR will clear 8GB data from the oldest for continuous recording without notice.

5.3. TIMER

In this menu list, you can schedule different sets of time for recording and detection function. Move to “TIMER”, and press ”ENTER”. Select to enable (ON) or disable (OFF) the recorder timer and / or detection timer functions.

1) RECORD TIMER

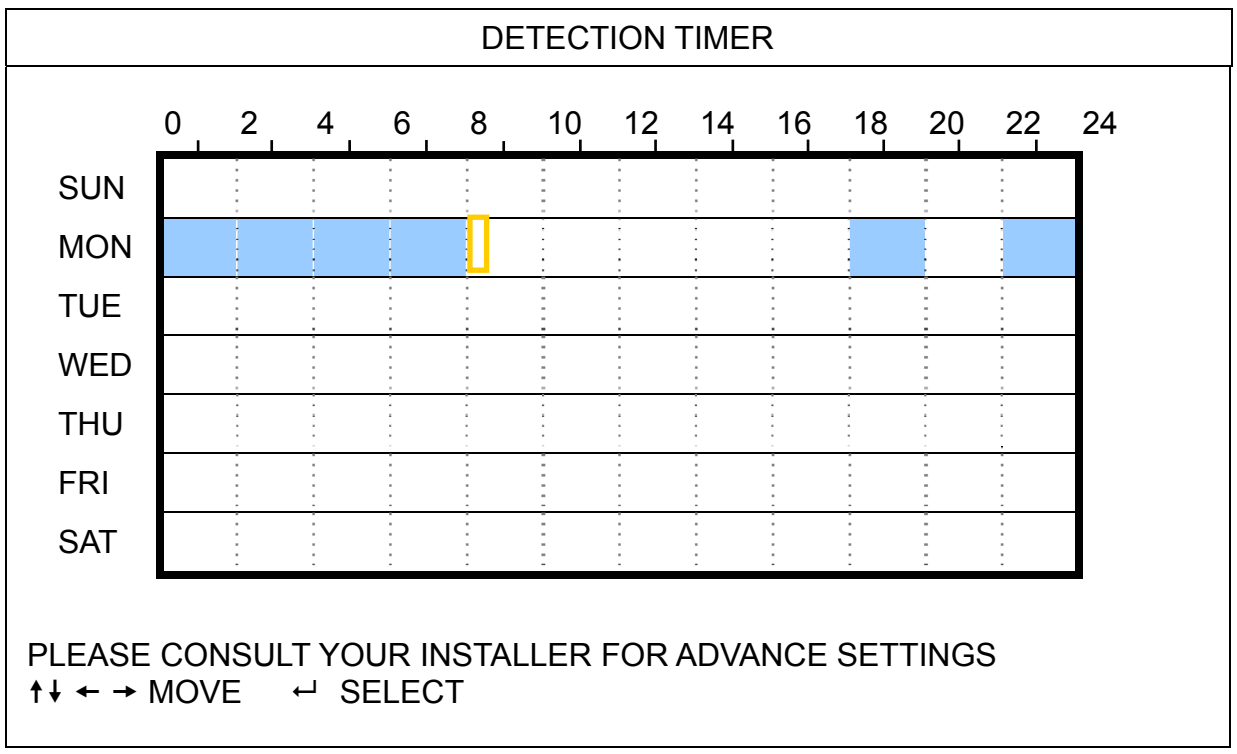
Use ▲ / ▼ to change the setting (ON / OFF). When it’s set to “ON”, press “ENTER” to go to its submenu for further settings.



X axis	0 ~ 24 hours. Each time interval within a square is two hours (divided into four 30-minutes).
Y axis	Monday ~ Sunday.
Operation	Move to the start time point, and press enter to set the start time point (marked in red color). Then, press ▲ / ▼ / ◀ / ▶ to set the timer-recording schedule. After setup, press “ENTER” again to create an ending time point (marked in yellow color) and press “MENU” to exit.

2) DETECTION TIMER

Use ▲ / ▼ to change the setting (ON / OFF). When it's set to "ON", press "ENTER" to go to its submenu for further settings.



X axis	0 ~ 24 hours. Each time interval within a square is two hours (divided into four 30-minutes).
Y axis	Monday ~ Sunday.
Operation	Move to the start time point, and press enter to set the start time point (marked in red color). Then, press ▲ / ▼ / ◀ / ▶ to set the timer-recording schedule. After setup, press "ENTER" again to create an ending time point (marked in yellow color) and press "MENU" to exit.

Note: This function here is only for detection timer setup and activation.

5.4. DETECTION

In this submenu, you can set up detection-related functions.
Move to "DETECTION", and press "ENTER". The screen will show the following submenu items:

1) TITLE

Show the camera title of each channel set in "CAMERA".

2) DET

The available options vary depending on the model you have.
For Model 1 & 2: Select if you want to activate the motion detection function for the selected channel (ON/OFF).
For Model 3 & 4: Select HIGH / NORMAL / LOW to activate the motion detection function with different sensitivity for the selected channel, or select OFF to disable this function.

3) AREA

Press "ENTER" to set the detection area. You will see similar screens as the following:
Pink blocks represent the area that is not being detected while the transparent blocks are the area under detection.
There are two different methods to set the detection area depending on the model you have.

Model 1 & 2

Transparent blocks are the area under detection.

Press “ENTER” to confirm the start area.

Press ◂ / ▸ to choose the width of the detection area.

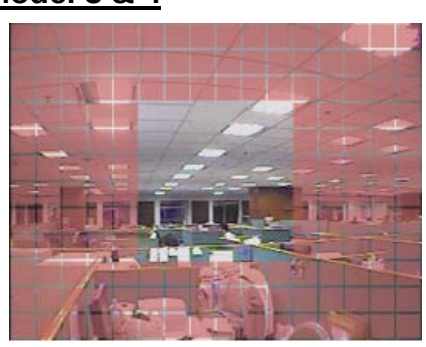
Press ▲ / ▼ to choose the height of the area.

You can also set up multi-detection area.

When any movement is detected, you will see the grids are flashing.

*Pink blocks represent the area that is not being detected while the transparent blocks are the area under detection.

Model 3 & 4



*Pink blocks represent the area that is not being detected while the transparent blocks are the area under detection.

There are three detection areas for your choice:
Press “▲” or ” ◂ ” once to broaden the detection area.
Press “▼” or ” ▸ ” once to narrow the detection area.

4) LS (Level of Sensitivity) (Selected models only)

“LS” is to set the sensitivity of comparing two different images. The smaller the value is, the higher sensitivity for motion detection.

5) SS (Spatial Sensitivity) (Selected models only)

“SS” is to set the sensitivity for detecting the size of one object (the number of the grids) on the screen. The smaller the value is, the higher sensitivity for motion detection.

Note: The default setting of SS is 03, which means once an object is detected more than 3 grids, the system will get triggered. So the value of SS must be less than the number of grids that you set up for the motion detection area.

---

6) TS (Time of Sensitivity) (Selected models only)

“TS” is to set the sensitivity regarding how long one object stays in the detection area and triggers the recording. Depending on the model you have, you may see either of the following methods:
a). Select a value -- The smaller the value is, the higher sensitivity for motion detection.
b). Select an option – HIGH / NORMAL.

7) RE (Reference) (Selected models only)

“RE” is to set a reference for detection. The default value is 10, which means the DVR will compare 10 continuous images at one time according to the sensitivity of LS, SS, TS simultaneously.

8) ALARM (Selected models only)

Select N.C. (Normally Closed) / N.O. (Normally open) / OFF for the alarm polarity. The default alarm value is OFF.

5.5. REMOTE (Selected models only)

In this menu list, you can set up remote devices to work properly.
Move to “REMOTE”, and press ”ENTER”. You will see the following submenu items:

1) TITLE

Show the camera title of each channel set in “CAMERA”.

2) DEVICE

Select the device type (CAMERA / PTZ) according to the connected camera for each channel.

3) ID

Set the ID number (0 ~ 255) for a PTZ camera. After connecting to a PTZ camera correctly, the default ID of the PTZ camera will be shown on the screen.

4) PROTOCOL

Select NORMAL (our protocol), P-D (PELCO-D) or P-P (PELCO-P) protocol.

5) RATE

Set the baud rate of each channel (2400 / 4800 / 9600 / 19200 / 57600 / 115200). For the connected cameras, such as PTZ and speed dome cameras, etc., please make sure their baud rate setting is the same as the setting here.

5.6. SYSTEM INFO

In this menu list, you can check or change some system settings.
The submenu items are described below:

1) SERIAL TYPE (Selected models only)

Show the serial type of the DVR (RS485).

2) BAUDRATE (Selected models only)

Set the baud rate of the DVR (2400 / 9600 / 19200 / 38400 / 57600 / 115200).

3) HOST ID (Selected models only)

Set the ID of the DVR (0 ~ 254).

4) PASSWORD

Press “ENTER” to reset the password for accessing the DVR system. You can set the password up to 4 digits.

5) RESET DEFAULT

Press “ENTER” to reset all settings as default, and select “YES” to confirm or “NO” to cancel.

6) CLEAR HDD

Select the HDD you want to clear. Press “ENTER”, and select “YES” to confirm to clear HDD or “NO” to cancel.

7) UPGRADE

Before using the USB flash drive, please use your PC to format the USB flash drive as FAT32 format first. Then, save the upgrade file in a compatible USB flash drive, and insert it into the USB port at the front panel. Press “ENTER”, and select “YES” to confirm upgrade or “NO” to cancel.

Note: To use this function, you need to have the upgrade file saved in a compatible USB flash drive, and insert it into the USB port at the front.

Note: Do not disconnect the power of your DVR while the upgrade process is in progress, or the DVR functions may not work normally or be unable to use.

8) AUTO KEYLOCK (SEC)

Set the time-out in second after which the key lock function is activated (NEVER / 30 / 60 / 120).

9) LANGUAGE

Select the language of the OSD.

10) VIDEO FORMAT

Here shows the information of the DVR video format (NTSC / PAL).

11) VERSION

Here shows the firmware version information.

5.7. NETWORK (Selected models only)

In this menu list, you can set up the network.
Move to “NETWORK”, and press “ENTER” to enter the submenu. The submenu items are described below.

5.7.1. STATIC

1) NETWORK TYPE

Select the network type as STATIC and set all the information needed in the DVR.

2) NETWORK INFORMATION (IP / GATEWAY / NETMASK)

Key in all the network information obtained from your ISP (Internet Service Provider).

3) DNS (PRIMARY DNS / SECONDARY DNS)

Key in the IP address of the domain name server obtained from your ISP (Internet Service Provider).

4) PORT

The valid number ranges from 1 to 9999. The default value is 80. Typically, the TCP port used by HTTP is 80. However in some cases, it is better to change this port number for added flexibility or security.

See the example below:

STATIC	
NETWORK TYPE	STATIC
IP	192 . 168 . 001 . 012
GATEWAY	192 . 168 . 001 . 254
NETMASK	255 . 255 . 252 . 000
PRIMARY DNS	168 . 095 . 001 . 001
SECONDARY DNS	139 . 175 . 055 . 244
PORT	0080
PLEASE CONSULT YOUR INSTALLER FOR ADVANCE SETTING	
↑↓ SELECT ← BACK → NEXT ↵ ENTER	

5.7.2. PPPOE

1) NETWORK TYPE

Select the network type as PPPOE.

2) USER NAME / PASSWORD

Set the “username” and “password” subscribed from your ISP supplier

3) DNS (PRIMARY DNS / SECONDARY DNS)

Key in the IP address of the domain name server obtained from your ISP (Internet Service Provider).

4) PORT

The valid number ranges from 1 to 9999. The default value is 80. Typically, the TCP port used by HTTP is 80. However in some cases, it is better to change this port number for added flexibility or security.
See the example below:

PPPOE	
NETWORK TYPE	PPPOE
USER NAME	EMPTY
PASSWORD	EMPTY
IP	000 . 000 . 000 . 000
GATEWAY	000 . 000 . 000 . 000
NETMASK	000 . 000 . 000 . 000
PRIMARY DNS	168 . 095 . 001 . 001
SECONDARY DNS	139 . 175 . 055 . 244
PORT	0080

PLEASE CONSULT YOUR INSTALLER FOR ADVANCE SETTING
↑↓ SELECT ← BACK → NEXT ↵ ENTER

Note: The PPPOE function needs to have one “username” and one “password” subscribed from one ISP supplier, and a “DDNS account” to correspond the dynamic IP address to a specific “Hostname”.

5.7.3. DHCP

1) NETWORK TYPE

Select the network type as DHCP.

2) DNS (PRIMARY DNS / SECONDARY DNS)

Key in the IP address of the domain name server obtained from your ISP (Internet Service Provider).

3) PORT

The valid number ranges from 1 to 9999. The default value is 80. Typically, the TCP port used by HTTP is 80. However in some cases, it is better to change this port number for added flexibility or security.

See the example below:

DHCP	
NETWORK TYPE	DHCP
IP	000 . 000 . 000 . 000
GATEWAY	000 . 000 . 000 . 000
NETMASK	000 . 000 . 000 . 000
PRIMARY DNS	168 . 095 . 001 . 001
SECONDARY DNS	139 . 175 . 055 . 244
PORT	0080

PLEASE CONSULT YOUR INSTALLER FOR ADVANCE SETTING
↑↓ SELECT ← BACK → NEXT ↵ ENTER

Note: This DHCP function needs to be supported by a router or a cable modem network with DHCP services, and a “DDNS account” to correspond the dynamic IP address to a specific “Hostname”, for this function to work properly.

5.8. BACKUP

In this menu list, you can choose to make a copy for a specified period time to a compatible USB flash drive for your own purpose.
The backup file can be played directly in your PC via the supplied licensed software “Video Viewer”. For details, please refer to “Playback” at page 22.

Note: Before making a video backup with audio, you need to make sure whether there’s any audio camera connected to the channel which supports audio recording, and there’s any recorded data for the channel.

5.8.1. USB BACKUP

Before making USB backup, please check if:

a). The USB flash drive is supported by your DVR. If not, the message “USB ERROR” will be shown on the screen.
For the list of the compatible USB flash drives, please refer to “APPENDIX 3 COMPATIBLE USB FLASH DRIVE LIST” at page 30.

b). The format of your USB flash drive is "FAT 32". If no, please format it to “FAT 32” in your PC.

c). There is no data in the USB flash drive. If yes, it’s recommended to clear all data in the USB flash drive before starting the backup.

Note: When USB backup starts, it’s not allowed for OSD menu operation or network backup in order to keep the consistency of the video data.

Note: You can backup up to 2GB video data for one-time USB backup. To backup more data, please set the time & channel(s) you want, and start USB backup again.

Move to “BACKUP”, and press ”ENTER”. You will see the following submenu items:

1) START TIME

Select the start time of the backup.

2) END TIME

Select the end time of the backup.

3) AVAILABLE SIZE

Display the available capacity in the inserted USB flash drive.

4) CHANNEL

Select channels by pressing “ENTER” button to change the symbol in front of the channel number.
Symbol “ ☑ ” means that this channel is selected to backup.

Symbol “ □ ” means that this channel is not selected to backup.

5) HDD NUM

Select the HDD containing the data you need.

6) START

Press “ENTER” to start copying the chosen data to the USB flash drive.

Note: Depending on the model you have, this DVR series supports **UP TO FOUR** audio-in channels, which are Audio 1, Audio 2, Audio 3 and Audio 4 accordingly, and the audio data will be recorded with the video data of CH1, CH2, CH3 and CH4 respectively.

For example, if your DVR supports two audio-in, its audio channels will be Audio 1 and Audio 2. When you playback CH1, you will also hear the audio recording of Audio 1.

6. REMOTE OPERATION

You can also control the DVR remotely via the supplied licensed software “Video Viewer” (hereafter called the “Video Viewer”), IE web browser, and Apple’s QuickTime player **ONLY** when your DVR supports the network function.

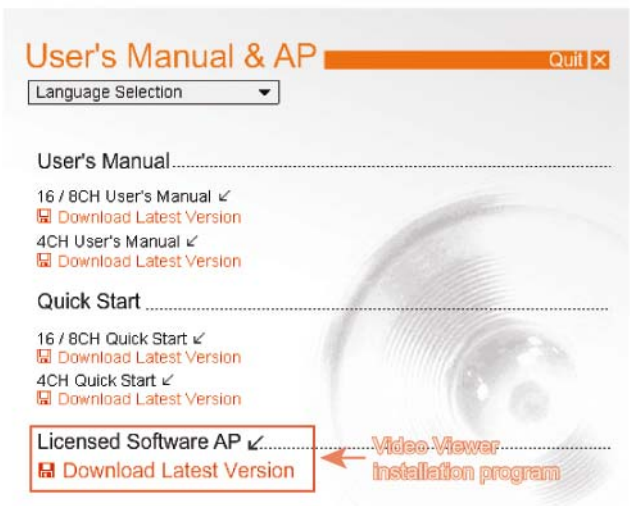
Note: The buttons and functions described below may differ from the actual ones and are for selected model(s) only.

6.1. Video Viewer

6.1.1. Installation & Network Connection

1) Install the software

Step1: Place the supplied CD into your CD-ROM or DVD-ROM drive. The program will be automatically run.



Step2: Click “Licensed Software AP” to install Video Viewer, or click “Download Latest Version” under “Licensed Software AP” to download the latest version of Video Viewer from the Internet.

Step3: follow the on-screen instructions to finish the installation. When the installation is completed, a shortcut icon “” will be placed on your PC desktop.

2) Network Connection

➢ Local Connection (via LAN)

a) Connect the DVR to your PC via a RJ-45 network line. The default DVR IP address is “192.168.1.10”, and the default user name and password are both “admin”.

b) Set the PC’s IP address as “192.168.1.XXX” (1~255, except 10) in order to make the PC and DVR under the same domain.

c) Double-click “” icon on your PC desktop to enter the control panel. By defaults, the “Address Book” () panel will be displayed on the right side of the control panel.

d) Click “” (Address Book) → “” (Add) button to key in the default IP address, user name, password, and port number of the DVR you intend to connect.

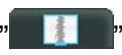
OR

Click “” (Search) → “” (Refresh) to search the available IP address(es) of other DVR(s) under the same domain as your PC’s IP address. The found address(es) will be listed, and can be added into the address book by clicking “” (Add into address book).

e) Double-click the IP address you just added into the address book to log in. When you’re logged in, the “Event” panel will be shown by defaults.

➢ Remote Connection (via Internet)

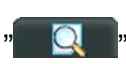
a) Double-click " " icon on your PC desktop to enter the control panel. By defaults, the "Address Book" panel will be displayed on the right side of the control panel.

b) Click "  " (Address Book) → " " (Add) button to key in the IP address, user name, password, and port number of the DVR you intend to connect.

The default DVR values are as follows:

Item	Default Value
IP address	192.168.1.10
User name	admin
Password	admin
Port	80

OR

Click "  " (Search) → " " (Refresh) to search the available IP address(es) of other DVR(s) under the same domain as your PC's IP address. The found address(es) will be listed, and can be added into the address book by clicking " " (Add into address book).

c) Double-click the IP address you just added into the address book to log in. When you're logged in, the "Event" panel will be shown by defaults.

6.1.2. Control Panel

After setting up the network information, login user name and password, double-click " " on the PC desktop to open and log into the control panel. You will see a screen similar to the following with 7 major sections:

NO.	Button	Function	Description
①	N/A	Image Display	The place where the images are displayed.
②		Address Book	Click to show the predefined IP address(es). You can add, remove or search the IP address to log in the DVR remotely. Two sub-functions are available for this button: Address Book and Search.
③		Miscellaneous Control	Click to show the main operation functions: audio volume control, color

NO.	Button	Function	Description
			setting, backup, DVR setting, upgrade, and find event logs. For details, please see “Miscellaneous Control” at page 21.
④	/	Record / Record Stop	Click to start / stop the manual recording.
⑤		Snapshot	Click to take a snapshot of the current view. The snapshot will be saved in the path you specified in “Record Setting”.
⑥		Information	Click to show the current network connection details.
⑦		DVR Control	Click to go to the DVR control panel to operate the DVR remotely.

Miscellaneous Control

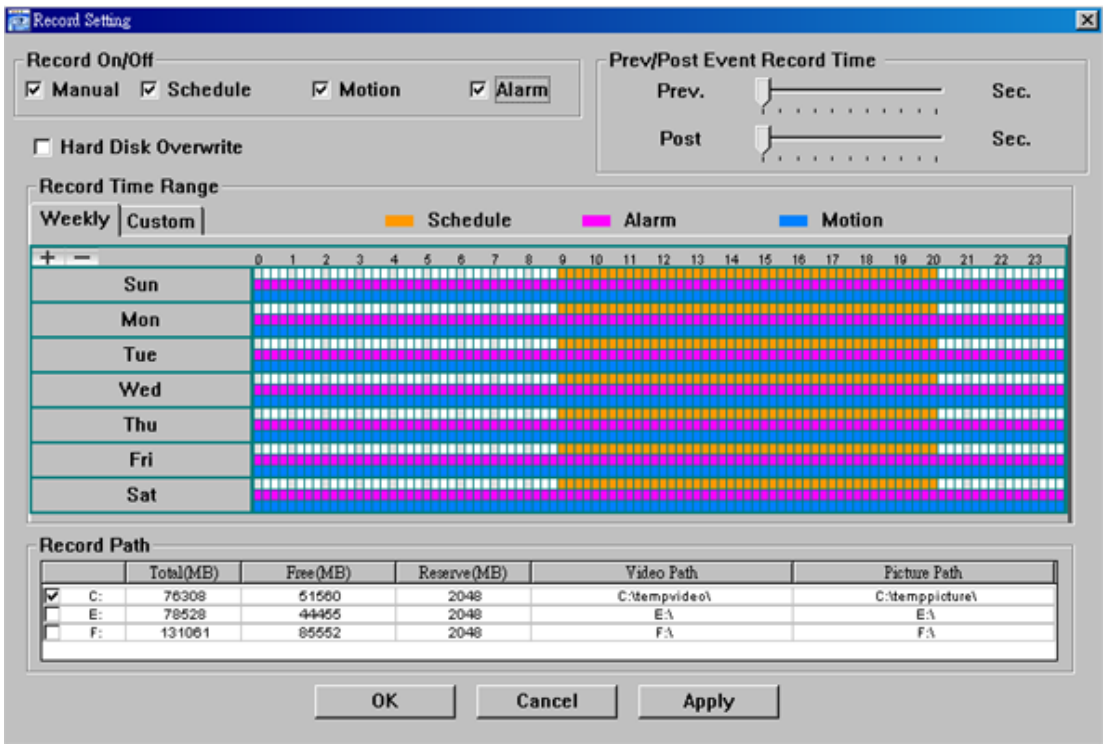
Click “” on the control panel, and six functions are available as follows:

Button	Function	Description
	Color Setting	Click this button to adjust the brightness / contrast / hue / saturation for a single channel or the whole channels.
	Backup	To make a video backup remotely, click this button, and you will go to the download setting page.
	Record Setting	Click to go to the detailed record setting.
	Server Setting	Click to go into the detailed DVR setting.
	Tools	Click to update the firmware version, multilingual OSD and boot display of your DVR remotely.
	Status List	Click to view all event and recording logs, search the desired log(s) by date, or playback the recording of the selected log.

6.1.3. General Operation

Record

To record remotely at the same time when any event alarm is triggered at the DVR side, click “” → “” to go to the “Record Setting” page.



In the “Record Setting” page, you can set the following items:

·Record type

·Hard disk overwriting

·Pre- / post-alarm record time

·Record time setting

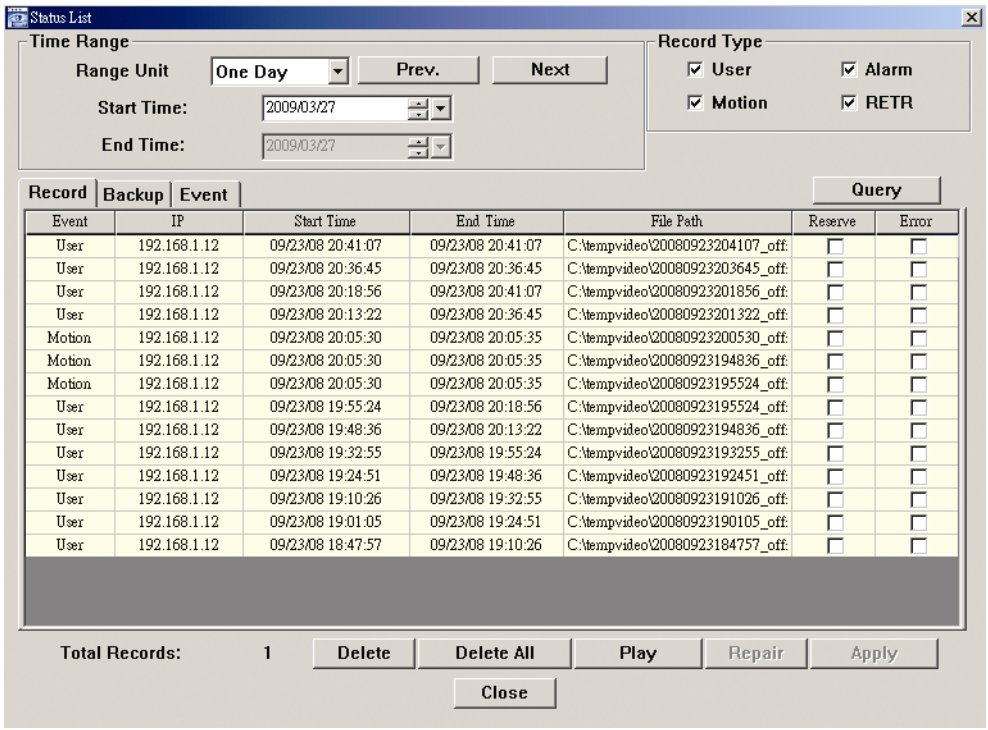
·Record path

If “Manual” is checked, click “ ” on the main control panel to start the manual recording immediately, and the recordings will be saved in the specified location. The red text indication “REC” will be shown at the top left corner of the image display view.

If “Motion” and / or “Alarm” are checked, the recording function will also be enabled at the remote side when any event is triggered at the DVR side, and the recordings will be saved in the specified location.

Playback

To play a recording, click “ ” → “ ”, and select the “Record” tab or “Backup” tab. A list of all the recordings will be shown by defaults, and you can also sort out the logs you want to speed up the search time.

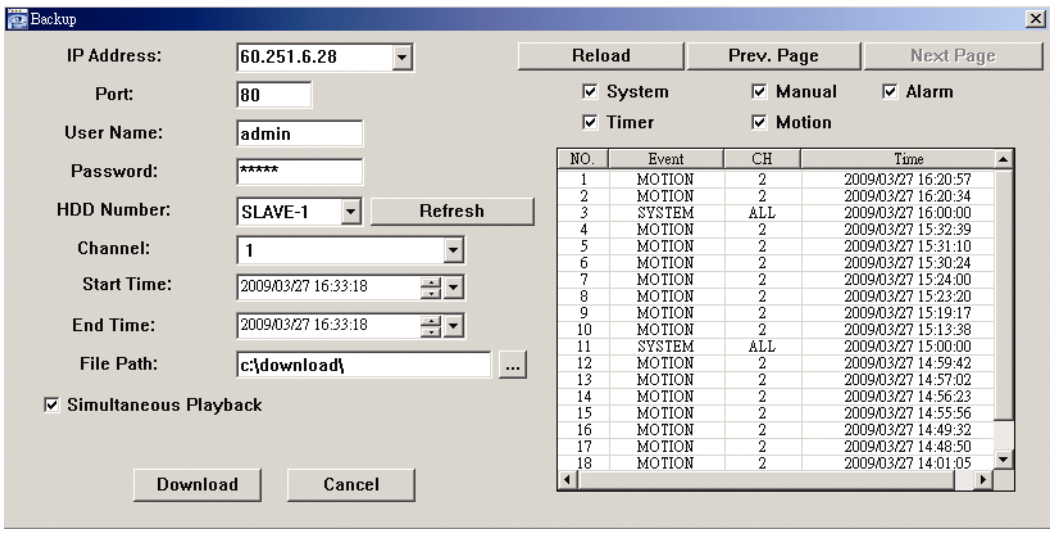


To immediately play a recording, select a log from the list, and click “Play”, or double-click the selected log. Then, the playback control panel will be shown at the bottom of the main control panel similar to the following.

Network Backup

Click “ ” → “ ” to go into the “Backup” page as follows, and you can select a specific time range or event to make a video backup remotely.

Note: Before enabling the network backup function, make sure the DVR is not in the playback mode, or the DVR will stop playback.



Function	Description
IP Address / Port / User Name / Password	Check if the network connection information of the DVR within which contains the video data you need is correct.
HDD Number / Channel	Specify the hard disk (HDD Number) and channel number (Channel) within which have the video data you need.
Download by Time	Specify the time range within which has the video data you want in the “Start Time” and “End Time” columns.
Download by Event	Select an event log from the event list. This list shows all logs in the specified DVR from the latest to the earliest. ·To quickly find the events you need, check or uncheck the event type “System” / “Manual” / “Alarm” / “Motion”, and select the log you want. ·To view the earlier or later logs that are not shown in the current page, click “Prev. Page” or “Next Page”. ·To refresh the event list, click “Reload”.
File Path	Assign the location where the backup files are saved.
Simultaneous Playback	To view the backup images simultaneously when the download process is in progress, select the checkbox “Simultaneous Playback”. You will see the backup images while the images are being downloaded to the PC or notebook. To simply backup images without previewing, deselect the checkbox “Simultaneous Playback”. You will only see a message box indicating the total time needed, the current status and the saving location.
Download / Cancel	Click “Download” to start or “Cancel” to discard the video backup.

6.2. IE Web Browser

Note: The supported PC operation systems are Windows Vista / XP / 2000.

Step 6: Key in the IP address used by your DVR in the URL address box, such as 60.121.46.236, and press Enter. You will be prompted to enter the user name and password to access the DVR.

If the port number your DVR used is NOT 80, you need to key in the port number additionally. The format is ***ipaddress*:*portnum***. For example, for IP address 60.121.46.236 and port No. 888, please key in "http://60.121.46.236:888" into the URL address box, and press "Enter".

Step 7: Enter the user name and password, the same as the ones used for video viewer login, and press "OK". You will see a screen when the login information is correct.

Note: The buttons and functions described below may differ from the actual ones and are for selected model(s) only.

NO.	Function	Description
1	Home	Click to go to the main page of the DVR
2	Config.	Click to go to the detailed DVR setting.
3	PTZ	Click to enter the PTZ mode.
4	Channel Selection	Click one of the number to switch to the channel you want to see in full screen.
5	Selection	Click or to go to the previous / next channel, or change setting.
6	Display Mode	: Click to show 4-cut display. : Click to display each channel one by one, starting from CH1. When the last channel is displayed, it will start from CH1 again. To exit from this display mode, press any other channel display button.
7	Menu and Arrow Keys	: Click to enter the menu / exit the menu mode. / : Move the cursor up / down to select the previous / next menu or sub-menu function, or change the setting. / : Move the cursor left / right to the previous / next sub-menu items.
8	Event	Click to enter the playback search settings screen.
9	Snapshot	Click to take a snapshot for the current view, and open another browser window to display the captured image.
10	Key Lock	Click to enable the DVR key lock function. To unlock the DVR, key in your password, and press .

NO.	Function	Description
11	Enter	Click to confirm the setting or enter your selection.
12	Digital Zoom	Click to zoom in / out the selected channel image.
13	Search	Click to enter the DVR full search menu. You can check all the logs here, and select one of them to payback.
14	Playback control buttons	(Stop) / (Play) / (Rewind) / (Forward) / (Pause) / (Slow Playback) **Rewind / Forward** Click once to get 4X fast rewind / forward, twice to get 8X, three times to get 16X, and four times to get 32X the highest. **Slow Playback** Click once to get 4X slow playback and twice to get 8X slow playback.
15	Web Transmission	**H.264 / QuickTime** QuickTime is Apple Inc.'s multimedia software. You need to have QuickTime installed in you operation system first. When "QuickTime" is selected, you will be promoted to enter the user name and password to access the server of the DVR.
16	Change Quality	**BEST / HIGH / NORMAL / BASIC** Click to change the image quality.
17	Change Resolution	**4 CIF / CIF** Click to change the image resolution (4CIF: 704*480 / CIF: 352*240)
18	Remote Independent Operation Off / On (Selected models only)	 Click it to disable / enable the network independent function.
19	Audio Channel Selection (Selected models only)	 To hear the live audio remotely, click 1, 2, 3 or 4. means no camera supporting audio is connected to any audio channel. This function is available only when your DVR supports the audio function, and a camera supporting audio is connected correctly to the DVR. Note: (1) To know whether your DVR supports the audio function, please refer to "APPENDIX 5 SPECIFICATIONS" at page 32. (2) To know the audio channel(s) supported by your DVR, please refer to "3). AUDIO IN (Select models only)" in "2.2. Rear Panel" at page 3".

6.3. QuickTime Player

You can also use the QuickTime player to remotely log into the DVR and check the live view only.

Note: QuickTime is Apple's multimedia software. You need to have QuickTime installed in you operation system first, and you can access the DVR to see the live view.
If you have installed QuickTime, please skip Step 1.

Note: The latest version of QuickTime is V6.4 at the time this manual goes to press, and the supported operation systems are Windows Vista / XP / 2000, and Apple Mac.

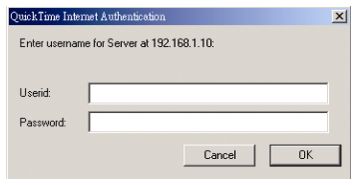
Step 1: Go to Apple's official website to download QuickTime. The website address is as follows:
http://www.apple.com/quicktime/win.html
a). Click "Free Download" to go into the download page, and select to download the free player.
b). Leave your Email address, and click "Free Download Now" to download the latest QuickTime player.
c). When the download is completed, execute the "QuickTimeInstaller.exe" file, and follow the on-screen instructions to finish the installation procedure.

Step 2: Open your QuickTime player. Select "File" → "Open URL in New Player…", and key in the URL address. The URL format is "rtsp://**ipaddress**/live/h264" (For example, "rtsp://**59.124.231.75**/live/h264").
Click "OK" to continue.

Step 3: A pop-up window will appear and prompt you to enter the authentication information.

Note: If you're not prompted to enter the authentication information, and the error message 10060 appears, go to "Edit" → "Preferences" → "QuickTime Preferences", and select "Streaming Transport" front he drop-down list. Select "Use HTTP", and keep the port ID as 80.

Key in the user name and password for accessing your DVR. The user name and password are the same as the ones you use to log into Video Viewer. If the information is correct, click "OK" to go on. If not, click "Cancel" to quit the accessing.
If the information is correct, press "OK" to go on. If not, press "Cancel" to quit the accessing.



Step 4: When the login is successful, you will see the live view.

APPENDIX 1 PIN CONFIGURATION (Selected models only)

PIN	FUNCTION	DESCRIPTION
1~4	ALARM INPUT	Connect ALARM INPUT (PIN1 – 4) and GND (PIN5) connector with wires. Once an alarm is triggered, the DVR will start recording and the buzzer will be on. PIN 1 is Alarm 1. Once the alarm is triggered, the CH1 of the DVR will start alarm-triggered recording. PIN 2 is Alarm 2. Once the alarm is triggered, the CH2 of the DVR will start alarm-triggered recording. PIN 3 is Alarm 3. Once the alarm is triggered, the CH3 of the DVR will start alarm-triggered recording. PIN 4 is Alarm 4. Once the alarm is triggered, the CH4 of the DVR will start alarm-triggered recording.
5	GND	GROUND
6	EXTERNAL ALARM COM	Under the normal operation, COM disconnects with NO. But when any alarm is triggered, COM connects with NO. Attention: The voltage restriction is under DC24V 1A.
7	EXTERNAL ALARM NO	Under the normal operation, COM disconnects with NO. But when any alarm is triggered, COM connects with NO. Attention: The voltage restriction is under DC24V 1A.
8	RS485-A	Using RS-485 serial communication signals, DVR can be controlled by keyboard controller.
9	RS485-B	Using RS-485 serial communication signals, DVR can be controlled by keyboard controller.
10~11	GND	GROUND

APPENDIX 2 TROUBLESHOOTING

Please refer to the table below for easy troubleshooting. The table describes some typical problems and also their solutions. Please check them before calling your DVR dealer.

· **FAQ (Frequently ask question)**

Questions	Solutions
No power	Check power cord connection.
	Confirm that there is power supplied from the outlet.
DVR is not working when pressing any button	You might be under “Key Lock” mode. Press any key and enter the password to exit this mode.
HDD detection failed	Replace with another HDD for testing.
	Replace with another HDD cable for testing.
Can’t detect your USB flash drive	Replace with another USB flash drive for testing.
	Format the USB flash drive as FAT32 format and try again.
No live video	Confirm the camera is power supplied.
	Check the setting of the camera lens.
	Check the monitor’s video cable and connection.
	Check the camera’s video cable and connection.
No recorded video	Check if the HDD is installed and connected properly.
	Check if “MANUAL RECORD ENABLE” option is set to “ON”, and the record function in the “CAMERA” menu is set to “ON”, too.
Timer recording is not working	Check if “TIMER RECORD ENABLE” option is set to “ON”, and the timer schedule has been arranged.
Motion detection recording is not working	Check if “EVENT RECORD ENABLE” option is set to “ON”.
	Check if the detection function “DET” is set to “ON”.
	Check if the detection area “AREA” has been set.
Can’t play the recorded data on my DVR	There must be at least 8192 images of recorded data for playback to work properly. If not, your DVR will stop the playback. For example, if the IPS is set to 30, the recording time should be at least 273 seconds (8192 images / 30 IPS) for the playback to work properly.
Can’t backup the video with audio	Make sure your DVR support the audio function.
	Make sure your camera supports the audio function.
	Make sure your audio camera is connected to the correct DVR audio input.
Can’t view the DVR images over the network with IE web browser after login	Check the DVR firmware version.
	Choose to allow the web browser ActiveX or applet in the pop-out message.
Failed to backup the recorded files of the DVR from the remote PC side	You need to be a supervisor to operate this function.
	Check if the network connection information is correct (IP Address / Port / User Name / Password).
	Specify the hard disk (HDD Number) and channel number (Channel) within which have the recorded data you need.
Failed to upgrade the firmware / OSD file via USB flash drive	Check if the USB flash drive is formatted to FAT32.
	Check if the firmware / OSD files are correct.
Can’t use the IR remote control	Check if your DVR supports the IR remote control.
	Check if the batteries are installed.
	Aim at the IR receiving zone next to the power indicator on the front panel, and try again.

APPENDIX 3 COMPATIBLE USB FLASH DRIVE LIST

Please upgrade the firmware of the DVR to the latest version to ensure the accuracy of the following table. If the USB flash drive is not supported by the DVR, the “USB ERROR” message will be shown on the screen.

Note: Please use your PC to format the USB flash drive as “FAT32”.

Note: You can backup up to 2GB video data for one-time USB backup. To backup more data, please set the time & channel(s) you want, and start USB backup again.

MANUFACTURER	MODEL	CAPACITY
Transcend	JFV35	4G
	JFV30	8G
Kingston	DataTraveler	1G
PQI	U172P	4G
Apacer	AH320	2GB
	AH320A	8GB
	AH220	1GB
	AH320	4GB
A-data	RB-18	1GB
Sandisk	Cruzer Micro	2G
	Cruzer Micro	4G
	Cruzer4-pk	2G
Netac	U208	1G
MSI	F200	4G
SONY	Micro Vault Tiny 2G	2G
	Micro Vault Tiny 4G	4G
	Micro Vault Tiny	1G

APPENDIX 4 COMPATIBLE SATA HDD LIST

MANUFACTURER	MODEL	CAPACITY	ROTATION
Seagate	ST3320613AS	320GB	7200 rpm
	ST33500320AS	500GB	7200 rpm
	ST3750330AS	750GB	7200 rpm
	ST31000340AS	1000GB	7200 rpm
WD	WD3200AAKS	320GB	7200 rpm
	WD5000AACS	500GB	7200 rpm
	WD6400AAKS	640GB	7200 rpm
	WD7500AAKS	750GB	7200 rpm
Maxtor	STM3500320AS	500GB	7200 rpm
	STM3750330AS	750GB	7200 rpm
HITACHI	HDT725032VLA360	320GB	7200 rpm
	HDS721010KLA330	1000GB	7200 rpm

APPENDIX 5 SPECIFICATIONS

MODEL	DVR-4200
Video System	NTSC / PAL (auto detection)
Video Compression Format	H.264
Video Input (composite video signal 1 Vp-p 75Ω BNC)	4 channels
Video Output (composite video signal 1 Vp-p 75Ω BNC)	Main monitor output
Audio Input / Output	4 audio inputs, 1 audio output (Mono)
Maximum Recording Rate (Frame)	704×480 pixels with 30 IPS <NTSC> / 704×576 with 25 IPS <PAL>
Maximum Recording Rate (Field)	704×240 pixels with 60 IPS <NTSC> / 704×288 pixels with 50 IPS <PAL>
Maximum Recording Rate (CIF)	352×240 pixels with 120 IPS <NTSC> / 352×288 pixels with100 IPS <PAL>
Image Quality Setting	Super Best, Best, High and Normal
Hard Disk Storage	Accommodates 1 SATA HDD (capacity up to 1TB)
Quick Search	Time / Motion / Alarm search mode
SATA Interface	Built-in
VGA Interface	Built-in (output resolution up to 1600 x 1200)
Recording Mode	Manual / Timer / Motion / Alarm / Remote
Multiplex Operation	Live display / record / playback / backup / network operations
Remote Independent Operation	Basic remote independent operation
Motion Detection Area	16 × 12 grids per camera for all channels
Motion Detection Sensitivity	4 adjustable parameters for accurate detection
Pre-alarm Recording	YES (8 MB)
Backup Device	USB 2.0 flash drive / Network
Web Transmitting Compression Format	H.264
Ethernet	10/100 Base-T. Supports remote control and live view via Ethernet
Web Interface	Supports licensed software “Video Viewer” / Internet Explorer & Mozilla Firefox web browsers / QuickTime (20 users access simultaneously)
	*Operating System: Windows Vista / XP / 2000; Apple Mac
Network Protocol	TCP/IP, PPPOE, DHCP and DDNS
IR Remote Control	YES (IR receiver built-in)
Picture Zoom	2X digital zoom (Live & Playback)
PTZ Control	YES
Alarm I/O	4 inputs, 1 output
Picture Zoom	2X digital zoom (Live & Playback)
Key Lock (Password Protection)	YES
Video Loss Detection	YES
Camera Title	Supports up to 6 letters
Video Adjustable	Hue / Saturation / Contrast / Brightness
Date Display Format	YY/MM/DD, DD/MM/YY, MM/DD/YY, and Off

MODEL	DVR-4200
Daylight Saving	YES
Power Source (±10%)	DC 19V
Power Consumption (±10%)	< 42 W
Operating Temperature	10℃ ~ 40℃ (50℉~104℉)
Dimensions (mm)**	343(W) × 59(H) × 223(D)
System Recovery	System auto recovery after power failure

* The specifications are subject to change without notice.

** Dimensional Tolerance: ±5mm

APPENDIX 6 RECORDING TIME TABLE

The recording time is tested under the PAL system, and the testing environment is a normal office, just for reference only. The supported record mode may vary depending on the model you have.

The recording time may vary depending on the following three factors:

- Different camera resolution;
- Different picture complexity;
- Different frequency of the object movement

Record mode	Quality	IPS	MB/Hour	750GB Record Time (day)
FRAME	SUPER BEST	25	925	33.78
		12	650	48.08
		7	520	60.10
		3	445	70.22
	BEST	25	875	35.71
		12	620	50.40
		7	475	65.79
		3	421	74.23
	HIGH	25	865	36.13
		12	600	52.08
		7	450	69.44
		3	400	78.13
	NORMAL	25	768	40.69
		12	570	54.82
		7	440	71.02
		3	385	81.17
FIELD	SUPER BEST	50	900	34.72
		25	800	39.06
		12	580	53.88
		7	460	67.93
	BEST	50	890	35.11
		25	780	40.06
		12	540	57.87
		7	450	69.44
	HIGH	50	865	36.13
		25	740	42.23
		12	460	67.93
		7	440	71.02
	NORMAL	50	790	39.56
		25	720	43.40
		12	450	69.44
		7	430	72.67
CIF	SUPER BEST	100	1010	30.94
		50	720	43.40
		25	540	57.87
		12	455	68.68
	BEST	100	910	34.34
		50	635	49.21
		25	510	61.27
		12	435	71.84
	HIGH	100	875	35.71
		50	600	52.08
		25	480	65.10
		12	420	74.40
	NORMAL	100	805	38.82
		50	570	54.82
		25	450	69.44
		12	410	76.22